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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,965	03/31/2004	Clifford Earl Shamblen	129955/11854 (21635-0122)	8707

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EXAMINER	
MCGUTHRY BANKS, TIMA MICHELE	

ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
04/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/814,965	SHAMBLEN ET AL.	
	Examiner	Art Unit	
	TIMA M. MCGUTHRY-BANKS	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5,7-23,28 and 29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,7-23,28,29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1, 17, 20, 23, 28, and 29 are as previously presented, Claims 4, 5, 7-16, 18, 19, 21, and 22 are as originally filed, and Claims 2, 3, 6,and 24-27 are cancelled.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 7, 11, 13, 15, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al (US 2002/0005089) or Kundrat (5,567,224) in view of Peras (US 3,234,608).

Nagata et al teaches a method for manufacturing high purity Fe by reducing iron oxide to more than 90% Fe in a solid state, then melting (abstract). Although heat is used, carbon is required for reduction [0037]; therefore the mechanism is chemical reduction. Since Nagata et al teaches reduction in a solid state, at least some reduction occurs without melting the initial metallic product. The product produced is high purity iron (abstract) or iron alloy, metallic nickel or alloys thereof [0065]. Nagata et al further teaches furnishing at least two nonmetallic precursors, including iron and nickel oxides [0065], therefore the base metal and one other metallic element are added. While Nagata et al does not specifically teach that a nickel-base, iron-base, or iron-nickel base alloy is formed; such would be the case when iron oxide is at least partially substituted with nickel [0065] in the disclosed process. While Nagata et al does not

disclose that the melt is solidified, such would be the case since Nagata et al discloses separation and discharge of the molten product from the furnace [0061]. Regarding Claim 7, the reduction is in the solid phase. Regarding Claim 11, carbon is mixed with the iron oxide. Regarding Claim 13, Nagata et al does not teach adding a metallic alloying element to the initial metallic particle prior to melting. However, Nagata et al does not disclose solidifying to produce a cast ingot of the metallic alloy as claimed.

Kundrat teaches a method of reducing a metal oxide including chromium ore, nickel ore, and stainless steel flue dust with coal or coke in a rotary hearth furnace, producing a feedstock for a refining vessel when manufacturing alloyed iron, steel or stainless steel (abstract). The metal oxides are partially reduced on a rotary hearth by heating in the presence of carbon to at least 1000 °C then discharged to a melting furnace or refining vessel (column 4, lines 10-55). In example 2, Kundrat teaches reduction of a low sulfur nickel laterite ore (contains NiO and Fe_2O_3) with coal by heating to 1200 °C, producing reduced pellets, which are discharged into an iron bath in an EAF for production of steel such as ASISI 304 (column 10, lines 21-47). While Kundrat does not specifically teach that the reduction is without melting the initial metallic particles, such would be expected since 1200 °C is below the melting temperatures of Ni and Fe (1455 °C and 1538 °C, respectively). Although not specifically recited in Kundrat, the reduction is chemical since coal or coke is required. Further, in order to use the ore as intended by Kundrat to provide valuable alloying metals for producing stainless steel, (column 3, lines 8-10), one of ordinary skill in the art could expect that the reduced ore would be melted in the subsequent process step (i.e. iron bath) and subsequently solidified to produce a usable product (i.e. 304 stainless steel). Kundrat in example 2 teaches non-metallic precursor compounds NiO and Fe_2O_3

(column 10, lines 21-47). Regarding Claim 7, the reduction is in solid phase. Regarding Claim 11, the nonmetallic modifying element is carbon. Regarding Claim 13, Kundrat is silent with respect to adding a metallic alloying element to the initial metallic particle.

However, neither Nagata et al nor Kundrat disclose solidifying to produce a cast ingot of the metallic alloy as in Claims 1 and 15, melting and solidifying the initial metallic particle without contacting a ceramic material as in Claim 16, converting the cast ingot into a billet as in Claim 18.

Peras teaches a method of continuous casting direct reduced iron ores as consumable electrodes to remove contaminates included FeO resulting from incomplete reactions in the reduction process, producing marketable forms such as billets (column 1, lines 1 to column 2, line 17). The molten metal is received into a pouring ladle, from which the metal jet flows to a cooled copper ingot mold (column 5, lines 56-61). The solidified metal can be extracted in the form of bars, slabs, billets, or sections (lines 61 and 62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the melting/refining method of Peras to melt the reduced iron and iron/nickel intermediate products of Nagata et al or Kundrat, since Peras teaches removing contaminates and producing marketable billets.

Claims 1, 7-15, 17-21, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodfield et al (US 6,884,279 B2) in view of Shamblen et al (US 6,926,754 B2).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the

inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Woodfield et al teaches producing a metallic article as shown below in Figure 2:

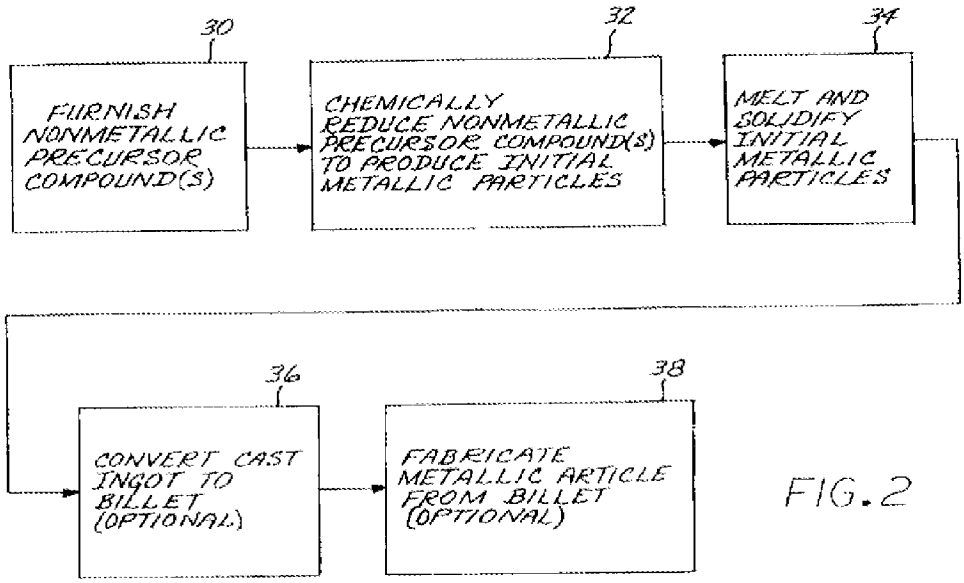


FIG. 2

Regarding Claims 5, 14 and 17, there may be intentional metallic and other additions to the melt during the melting and solidification step (column 8, lines 7 and 8). Regarding Claims 7-9, the reduction may be accomplished by solid-phase reduction, fused slat electrolysis or vapor-phase

reduction (column 2, lines 56-58). Regarding Claim 10, the reduction can occur with liquid alkali and/or liquid alkaline earth metal (lines 61 and 62). Regarding Claim 11, a nonmetallic modifying element such as oxygen or nitrogen may be mixed into the nonmetallic precursor compound (lines 62 and 63). Regarding Claim 12, the reduction is accomplished in a time of less than about 10 seconds (lines 65-67). Regarding Claim 13, additions may not occur (column 8, line 11). Regarding Claim 15, the melt is cast (Fig. 2). Regarding Claim 18, the ingot is cast to a billet (Fig. 2). Regarding Claims 19 and 20, the billet may be further mechanically worked and machined (column 3, lines 6-8). Regarding Claim 21, thermomechanical working includes hot forging (column 8, lines 23 and 24). Regarding Claim 28, the metallic article can be used as gas turbine engine disk (column 3, line 8). However, Though Woodfield et al teaches using any nonmetallic precursor compounds that are reducible oxides of the metals and gives a preferred teaching of titanium (column 4, lines 25-43), Woodfield et al does not specifically teach that the metallic article is a nickel-base superalloy, a cobalt-base superalloy, an iron-base superalloy, an iron-nickel-base superalloy, an iron-nickel-cobalt-base superalloy, or a martensitic steel as in Claim 1 or melting and solidifying the initial metallic particle without containing a ceramic material as in Claim 16.

Regarding Claim 1, Shamblen et al teaches that superalloys have wide application in the aircraft propulsion industry. They are fabricated by any of a number of techniques, such as refining metal-containing ores to produce molten mental, which is thereafter cast. Elements and combinations of elements may take many intermediate forms before being melted to form the final alloy. The metal is refined as necessary to remove or reduce the amounts of undesirable minor elements. The composition of the refined metal may also be modified by the addition of

desirable alloying elements. These refining and alloying steps may be performed during the initial melting process or during remelting. After a superalloy of the desired composition is produced, it may be used in the as-cast form or further worked. Further processing such as joining, heat treating, machining, surface coating and the like may be employed. All of these forms involve melt processing (column 1, lines 13-41). The superalloy includes a nickel-base, cobalt-base, iron-base, iron-nickel-base, or iron-nickel-cobalt-base alloy (column 3, lines 65-67). Though the preferred embodiment of Shamblen et al favors not using the melting process (e.g. column 3, line 42), Shamblen et al nonetheless teaches using a melt process. According to MPEP § 2141.03, a prior art reference must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use nonmetallic constituents that would produce the claimed superalloy in the process of Woodfield et al, since Shamblen et al teaches that such superalloys can be produced to form gas turbine parts.

Regarding Claim 16, Woodfield et al is silent with respect to contacting a ceramic material. Shamblen et al teaches that white spots are associated with extrinsic contamination from crucible ceramics; melt-related irregularities can significantly degrade the fatigue resistance of the superalloy material (column 2, lines 23-28). It would have been obvious to one of ordinary skill in the art at the time the invention was made not to contact the melted and solidified metallic particle with a ceramic material in Woodfield et al, since Shamblen et al teaches that this contact can significantly degrade the fatigue resistance of the superalloy material (column 2, lines 23-28).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Woodfield et al in view of Shamblen et al as applied to claim 1 above, and further in view of Goecmen et al (US 2002/0003008 A1).

Woodfield et al in view of Shamblen et al discloses the invention substantially as claimed. However, Woodfield et al in view of Shamblen et al does not disclose that the iron alloy could be martensitic steel as claimed. Goecmen et al teaches martensitic-hardenable heat-treated steel (abstract). Martensitic-hardenable steels are widespread in power plant engineering for such parts as rotor disks in gas and steam turbines [0002]. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the iron alloy article formed in Woodfield et al in view of Shamblen et al could be a martensitic steel, since Woodfield et al in view of Shamblen et al teach making articles for gas turbines and Goecmen et al teaches that martensitic steels are widespread in power plant engineering.

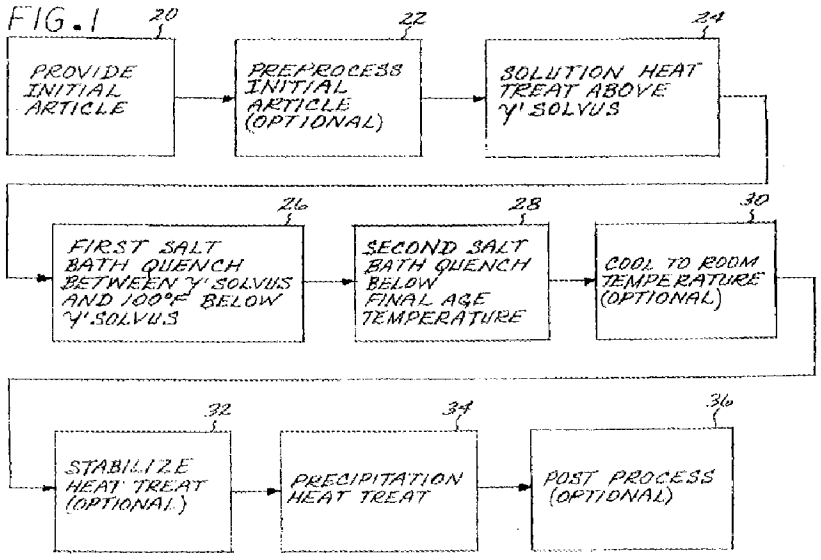
Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Woodfield et al in view of Shamblen et al as applied to claim 1 above, and further in view of Derwent publication 192-22788E for JP 57-026153.

Woodfield et al in view of Shamblen et al disclose the invention substantially as claimed. However, Woodfield et al in view of Shamblen et al do not disclose solution heat treatment and ageing the metallic article as claimed. The Derwent publication teaches heat treating nickel-base superalloys for use in high pressure steam by subjecting the alloy to solid solution treatment and ageing (title). It would have been obvious to one of ordinary skill in the art at the time the invention was made to subject the metallic article in Woodfield et al in view of Shamblen et al to solution heat treating and ageing as taught by the Derwent publication, since it teaches that the

obtained alloy structure has good intergranular corrosion in high pressure water or steam and corrosion is reduced (abstract).

Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woodfield et al in view of Shamblen et al as applied to claim 1 above, and further in view of Groh et al (US 7,033,448).

Woodfield et al in view of Shamblen et al discloses the invention substantially as claimed. However, Woodfield et al in view of Shamblen et al does not disclose solution heat treating and ageing as in Claim 22 or heat treating, heating and cooling as in Claim 23. Groh et al teaches preparing a nickel-base superalloy article such as a disk used in the turbine section of a gas turbine engine (column 4, lines 33-35) as taught below in Figure 1:



It would have been obvious to one of ordinary skill in the art at the time the invention was made to process the metallic article in Woodfield et al in view of Shamblen et al as taught by Groh et

al, since Groh et al teaches that this method results in articles with thick and or highly varying section thicknesses, without inducing unacceptably large thermal strains and stresses and distortions (column 2, lines 20-23).

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Woodfield et al in view of Shamblen et al.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Woodfield et al teaches producing a metallic article as shown below in Figure 2:

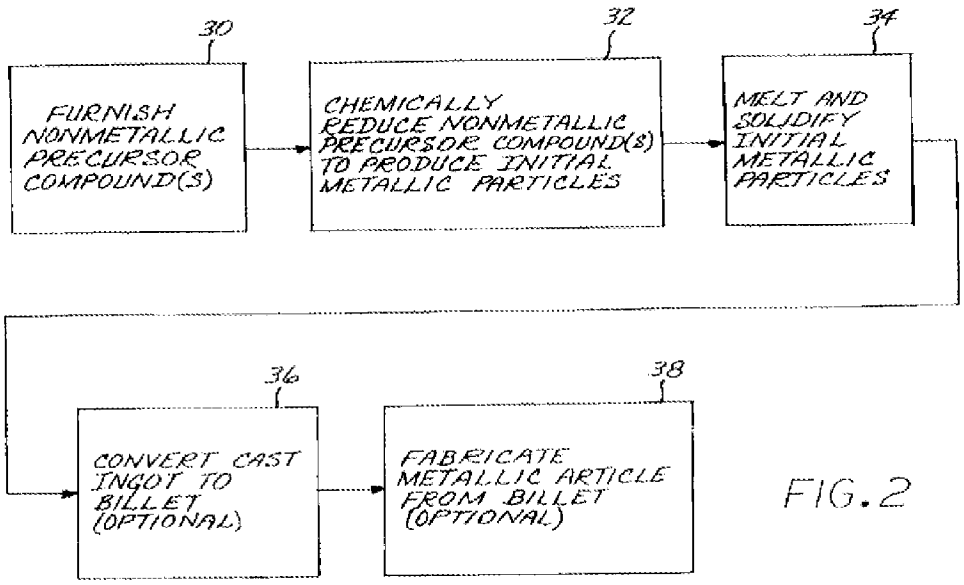


FIG. 2

The billet may be further mechanically worked and machined (column 3, lines 6-8). Thermomechanical working includes hot forging (column 8, lines 23 and 24). The metallic article can be used as gas turbine engine disk (column 3, line 8). However, Though Woodfield et al teaches using any nonmetallic precursor compounds that are reducible oxides of the metals and gives a preferred teaching of titanium (column 4, lines 25-43), Woodfield et al does not specifically teach that the metallic article is a nickel-base superalloy, a cobalt-base superalloy, an iron-base superalloy, an iron-nickel-base superalloy, an iron-nickel-cobalt-base superalloy, or a martensitic steel as in Claim 29.

Shamblen et al teaches that superalloys have wide application in the aircraft propulsion industry. They are fabricated by any of a number of techniques, such as refining metal-containing ores to produce molten mental, which is thereafter cast. Elements and combinations of elements may take many intermediate forms before being melted to form the final alloy. The metal is refined as necessary to remove or reduce the amounts of undesirable minor elements.

The composition of the refined metal may also be modified by the addition of desirable alloying elements. These refining and alloying steps may be performed during the initial melting process or during remelting. After a superalloy of the desired composition is produced, it may be used in the as-cast form or further worked. Further processing such as joining, heat treating, machining, surface coating and the like may be employed. All of these forms involve melt processing (column 1, lines 13-41). The superalloy includes a nickel-base, cobalt-base, iron-base, iron-nickel-base, or iron-nickel-cobalt-base alloy (column 3, lines 65-67). Though the preferred embodiment of Shamblen et al favors not using the melting process (e.g. column 3, line 42), Shamblen et al nonetheless teaches using a melt process. According to MPEP § 2141.03, a prior art reference must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use nonmetallic constituents that would produce the claimed superalloy in the process of Woodfield et al, since Shamblen et al teaches that such superalloys can be produced to form gas turbine parts.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In *re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 7-15, and 18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 9-19 and 23 of copending Application No. 11/059,715. Although the conflicting claims are not identical, they are not patentably distinct from each other because the present invention claims a metallic base selected from the group consisting of nickel, cobalt, iron, iron-nickel, and iron-nickel-cobalt and mixture thereof, and application '715 claims a metallic constituent.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1 and 10 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3 of U.S. Patent No. 6,884,279 in view of Shamblen et al (US 6,926,754 B2). The instant claims do not specifically teach that the metallic article is a nickel-base superalloy, a cobalt-base superalloy, an iron-base superalloy, an iron-nickel-base superalloy, an iron-nickel-cobalt-base superalloy, or martensitic steel as in Claim 1. Shamblen et al teaches that superalloys have wide application in the aircraft propulsion industry. They are fabricated by any of a number of techniques, such as refining metal-containing ores to produce molten mental, which is thereafter cast. Elements and combinations of elements may take many intermediate forms before being melted to form the final alloy. The metal is refined as necessary to remove or reduce the amounts of undesirable minor elements. The composition

of the refined metal may also be modified by the addition of desirable alloying elements. These refining and alloying steps may be performed during the initial melting process or during remelting. After a superalloy of the desired composition is produced, it may be used in the as-cast form or further worked. Further processing such as joining, heat treating, machining, surface coating and the like may be employed. All of these forms involve melt processing (column 1, lines 13-41). The superalloy includes a nickel-base, cobalt-base, iron-base, iron-nickel-base, or iron-nickel-cobalt-base alloy (column 3, lines 65-67). Though the preferred embodiment of Shamblen et al favors not using the melting process (e.g. column 3, line 42), Shamblen et al nonetheless teaches using a melt process. According to MPEP § 2141.03, a prior art reference must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use nonmetallic constituents that would produce the claimed superalloy in the process of instant Claim 1, since Shamblen et al teaches that such superalloys can be produced to form gas turbine parts.

Response to Arguments

Applicant's arguments, filed 8 February 2008, with respect to the claims have been fully considered and are persuasive. The rejections in the non-final office action mailed 10 October 2007 been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. application 11/059,715 and US 6,884,279.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMA M. MCGUTHRY-BANKS whose telephone number is (571)272-2744. The examiner can normally be reached on M-F 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. M. M./
Examiner, Art Unit 1793
9 April 2008
/Roy King/
Supervisory Patent Examiner, Art Unit 1793